Aug. 30, 1932. E. F. HATHAWAY ET AL 1,874,188

TUBE FRAME YARN SPOOL

Filed Jan. 30, 1929

Fig. 1.

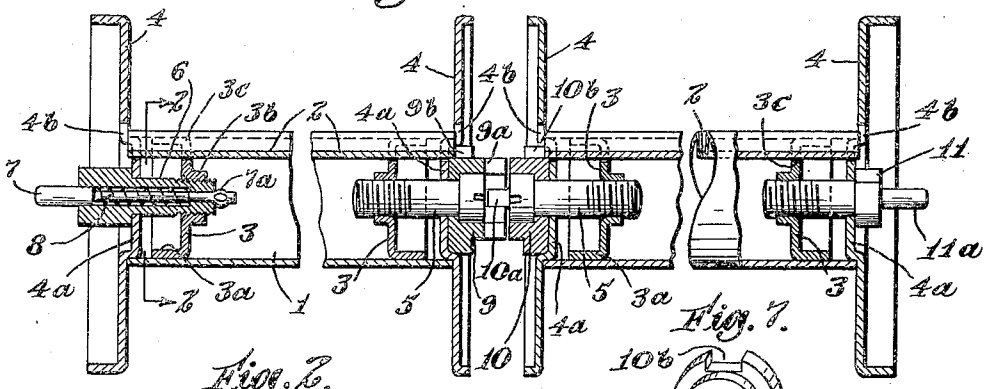


Fig. 2.

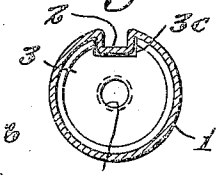


Fig. 3.

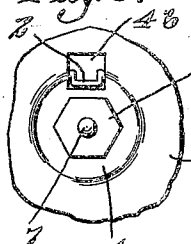


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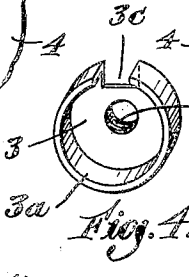


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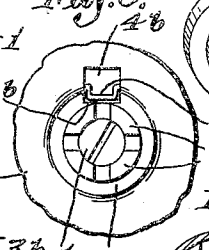


Fig. 6.

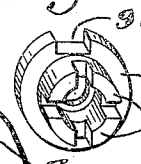


Fig. 7.

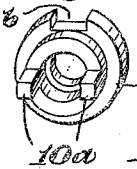


Fig. 8.

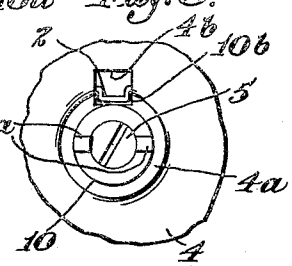


Fig. 9.

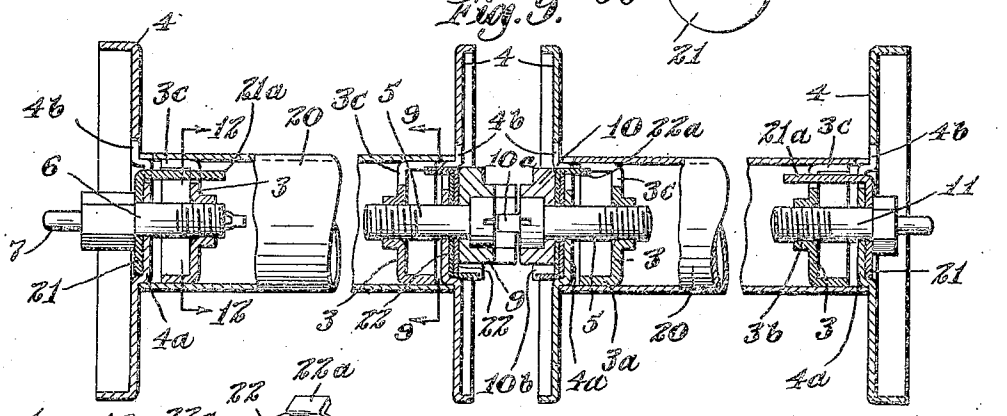


Fig. 10.

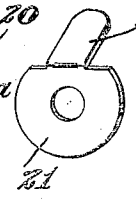


Fig. 11.

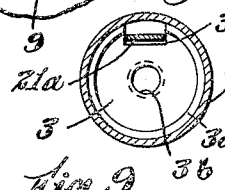


Fig. 12.

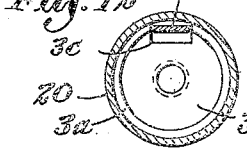
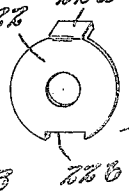


Fig. 13.



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UNITED STATES PATENT OFFICE

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TUBE FRAME YARN SPOOL

Application filed January 30, 1929. Serial No. 336,247.

This invention relates to yarn spools and is especially adapted to the construction of yarn spools intended for use in tube frames, such as are used for weaving Axminster carpets and the like, and is intended to provide a strong and durable construction applicable to an all metal spool that permits the replacement of damaged parts of the spool while utilizing the undamaged parts, thereby effecting large economies in the use of such spools whose various parts are peculiarly subject to injury and damage. The construction also permits the assembling from substantially universal parts of spools that are adapted to form either the end spools or the intermediate spools of a multiple spool tube frame or the spool of a single spool tube frame. It also provides a construction by which plain cylindrical barrels or barrels provided with longitudinal grooves for the reception of yarn clamping means may be interchangeably used with the same heads and with the same bearing journals of various types appropriate to particular locations. The present invention is an improvement of this type of assembled yarn spools and an important feature resides in the construction by which the end heads are interlocked with the spool barrels by means of rigidly applied interlocking members that prevent rotative displacement between the spool head and the barrel. This rigid interlocking means may be integral with the spool barrel or may be rigidly but detachably secured to the end head of the spool.

In the accompanying drawing is illustrated two different forms of construction embodying the principles of this invention, in which

Fig. 1 is a longitudinal central section showing a pair of end to end spools in assembled relation for use in a tube frame.

Figs. 2, 3 and 4 are detail views showing respectively the construction of the anchoring member and its relation to the barrel in which it is inserted and the end head to which it is secured.

Figs. 5, 6, 7 and 8 are detail views showing the spool coupling members and the manner of securing them to their respective spools in order to obtain uniform and equal rotation of two aligned yarn spools.

Fig. 9 is a longitudinal central section showing a plain cylindrical barrel without the longitudinal groove in assembled relation to the same heads and journal members as are illustrated in Fig. 1.

Figs. 10, 11, 12 and 13 are detail views showing the means by which the end heads, similar to those shown in Fig. 1, are secured to a barrel of plain cylindrical form without the longitudinal groove.

In the practice of this invention, as illustrated in Fig. 1, the barrel 1 comprises a suitable length of cylindrical tubing provided on one side with a longitudinal groove or depression 2 for the reception of a clamping member or wire, such as is often used for clamping the inner ends of the yarn elements to the spool barrel.

At a short distance from the end of each barrel is secured an anchoring member 3, which comprises a disc 3 provided with an offset peripheral flange 3^a and also a smaller offset inner flange 3^b surrounding a central orifice and having its inner surface threaded to receive an anchoring or fastening screw, which forms a part of the journal bearing construction on which the spool is rotatably supported when in use.

The journal construction itself is varied according to its intended location in the tube frame, but whatever the intended position of the journal, whether it is to be mounted in the outside or end brackets of the tube frame or in the intermediate stands or brackets, all journal constructions are interchangeable to permit the assembling of the yarn pattern spools in any desired relation and in either a single or a multiple spool tube frame.

The end bracket journal construction comprises a threaded fastening bolt or screw 6 whose reduced shank has threaded engagement with the threaded boss or hub 3^b of the anchoring member, while its larger outer end portion is preferably of polygonal form and is provided with an outwardly extending bearing pintle which, as shown at the left of Fig. 1, embraces a telescopic shouldered pintle 7 mounted in a central bore of the

fastening member 6 and normally but yieldingly pressed outward by a light helical spring 8. The inner end of the reduced portion of the pintle is flattened or spread out to form a projection 7^a preventing the escape of the pintle from its supporting member 6.

As it is unnecessary to use the disappearing pintle on both ends of the spool, the one-piece journal member 11 with an integrally formed pintle 11^a may be used at the opposite end of the spool.

The anchoring disc 3 is provided with a peripheral notch 3^c for the reception of the internal projecting rib 2 that forms the longitudinal groove and, after being inserted a proper distance inside the end of the spool barrel, is integrally secured thereto preferably by spot welding, the terminals of the welding apparatus being conveniently applied against the inside of the flange 3^a and the opposing exterior point of the barrel.

The anchoring members 3 serve not only as anchorages for the attachment of the journal members and for clamping the end heads 4 firmly and rigidly against the ends of the barrel, but also by reason of their notched peripheries serve as means for interlocking the end heads against rotative displacement relative to the barrel, beside affording stiffening spiders for internally supporting the hollow barrels. Each end head 4 is provided with an interior inwardly offset annular portion 4^a forming an annular shoulder adapted to fit snugly inside the end edge of the barrel. At one point the end head is provided with a radial slot or recess 4^b intersecting the annular shoulder and dimensioned to allow the end portion of the inward rib 2 to be seated therein to form interlocking engagement. The end head 4 is placed against the end of the barrel with this slot or aperture 4^b longitudinally aligned with the notch 3^c in the anchoring member, and is clamped tightly in place by screwing in the fastening bolt 6. Therefore, the inwardly projecting rib 2 forms a rigid interlocking key interlockingly engaging the notch 3^c of the anchoring member and the slot 4^b in the head. This construction avoids the use of a loose interlocking member which has been heretofore proposed to use and which permits a certain amount of looseness in the connection between these two members.

In the case of a multiple spool tube frame it is usually desired to couple together the adjacent ends of the spools to secure uniform rotation. In this case, the end head construction is similar to that already described for the outer ends of the spools, but there are provided for the respective spools a coupling journal member 9 radially slotted to form segmental teeth 9^a, which interlock with similar projecting teeth 10^a formed on the complementary journal member 10. Both journal members are provided with peripheral notches to receive the extreme ends of the longitudinal ribs 2, so as to be interlocked with the head and with the barrel to prevent rotative displacement.

In Fig. 9 we have illustrated how the same heads and journal members may be applied to a plain cylindrical barrel which has no longitudinal depressed rib for receiving a yarn clamping member. In this case, the barrel 10 is a plain cylindrical tube provided with the interior anchoring members 3, such as have already been described. The rigidly supported interlocking means, by which the end head is positively locked against rotative displacement on the barrel, in this case for the outer end of the spool, comprises a centrally perforated flat disc 21 provided with an axially projecting tongue 21^a adapted to pass snugly through the slot 4^b in the head and the slot 3^c in the periphery of the anchoring member. This interlocking member 21 is placed flat against the central portion of the head 4 with its tongue projecting through the aligned slots aforesaid and is rigidly clamped against the head for which it forms a substantial reinforcement by means of the journal attaching member 6.

In order to lock the coupling journal members 9 and 10 to their respective spools and hold them against rotation we employ two discs 22 of substantially thinner metal than the disc 21, each having a short axially projecting tongue 22^a diametrically opposite to a peripheral notch 22^b. These two interlocking disc members are placed face to face with the prong or tongue of each projecting in opposite directions through the notch 22^b of the other, so that one tongue passes through the slot 4^b and into engagement with the peripheral notch 3^c in the anchoring member 3, while the outwardly projecting tongue enters the peripheral notch 9^b, or 10^b as the case may be, of the journal member. As these head locking members are clamped firmly against the central portions of the end heads 4 by the attaching screws 5, it will be seen that they also are rigidly supported in the construction and therefore prevent looseness or play in a rotative direction. The advantage of making them in two pieces is that in order to give the necessary sharpness of bend for the interlocking tongues they must be made of thin metal and must be dimensioned with sufficient precision so that when placed in position they will slightly overlap on the one side the edge of the slotted flange of the anchoring member and on the other side the notched portion of the journal coupling member.

It will be observed that the only additional parts used with the plain cylindrical barrel, that are not used in the longitudinally grooved barrel, are these locking discs 21 and 22, but these members being made of pressed

metal, formed in a single operation of a press, are of such trifling cost that they do not appreciably add to the expense of the spool. Therefore, we have a simple rigid and strong construction by which spools with or without longitudinally grooved barrels may be assembled to suit any desired location in a multiple spool tube frame or in a single spool tube frame, which are adapted not only to be reversed or to be transposed for the purposes of reversing the pattern, but which effects great economy, since any damaged part may be readily and conveniently replaced without going into the workshop, while all the undamaged parts are conserved for continued use. At the same time, in whatever form assembled the construction can be given the same degree of rigidity and absence of looseness that is obtainable in a permanently built up spool.

What we claim is:

1. A yarn spool embracing in its construction a tubular barrel formed with an inwardly projecting longitudinal rib, an interior anchoring member integrally secured inside the end portion of said tube and having a peripheral notch for receiving said rib, an end head provided with an inwardly offset annular portion dimensioned to be inserted in the end of the barrel and having a slot arranged to receive the end of said rib, whereby the head is rigidly and positively locked against rotative displacement on the barrel, and coaxially disposed releasable fastening means having threaded connection with the anchoring member and exerting an external thrust against the end head, thereby permitting replacement of the head and of the fastening member to adapt the spool to different positions in the tube frame.

2. A yarn spool embracing in combination a tubular barrel provided with an inwardly projecting longitudinal rib, an anchoring disc fixedly secured inside the end portion of the barrel and having a peripheral notch engaging said rib, an end head detachably held against the end of the barrel and provided with an opening through which said rib projects when so held, a journal member arranged against the outside face of the central portion of the end head, and an axial fastening member having threaded engagement with the anchoring member by which it clamps the journal member and the head firmly to the barrel, said journal member being also provided with a notch for interlocking engagement with said rib.

3. A yarn spool embracing in combination a tubular barrel, end heads adapted to be secured to the ends of said barrel, axially disposed journal members concentrically disposed outside of said end heads, an axial concentrically disposed fastening member for releasably securing the external journal member and the head firmly to the barrel, and rigidly arranged longitudinally extending means integral with the barrel for keying the journal and the head against rotative displacement in relation to the barrel.

4. A yarn spool embracing in its construction, a longitudinal barrel, a fixed anchoring member rigidly secured inside the hollow end portion of said barrel, an end head having an annular offset portion adapted to form telescopic engagement with said hollow barrel, and a head-fastening member having external engagement with the central portion of the end head and having threaded engagement with the anchoring member to clamp the head firmly to the end of the barrel and carrying a coaxial outwardly projecting spool journal, said barrel being provided with an internally projecting rib entering aligned openings formed in the end head and in the anchoring member, respectively, whereby rotative displacement of the end head is prevented.

In witness whereof we have subscribed the above specification.

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